REMARKS

In the above-identified office action the examiner has rejected claims 1-5, 9-13, 15 and 18-20 as being unpatentable over the European Publication 0 889 510 A1 (EP'510 A1) in view of Adachi et al. Applicant notes that claims 18-20 depend from claim 16 which has been indicated as allowed and accordingly applicant believes that claims 18-20 are allowable as well. The examiner has stated that it would have been obvious to modify an optimized process and product parameter and limitations as taught by EP'510 A1, with the process and parameter limitations as taught by Adachi. Applicant disagrees with the examiner's rationale.

Claims 2 and 13 recite a method for eliminating void defects after an initial oxide film had been formed; and forming a single crystal silicon that has undergone the elimination treatment. The inventors have discovered that existence of an initial oxide film (in particular, the film thickness) affects the elimination of the void defects in the crystal. On the other hand, EP'510 A1 does not teach or suggest that the existence of the initial oxide film (in particular, the film thickness) affects the elimination of the void defects in the crystal.

The following two embodiments of the subject method for eliminating the void defects exist:

(a) an initial oxide film present plus an ultra high temperature heat treatment at a temperature of at least 1300°C (claims 2 and 13); and

(b) an initial oxide film absent plus an ultra high temperature heat treatment at a temperature of at least 1200°C (claim 16)

According to the above method (a), once the initial oxide film with a thickness of 396 nm and above was formed, regardless of an initial oxygen concentration in the crystal, the void defects can be eliminated by performing the ultra high temperature heat treatment at a temperature of at least 1300°C. On the other hand, according to the above method (b), void defects can be eliminated by adjusting those parameters that are described in claim 16.

The basis for the numerical values in the ultra high temperature heat treatment are as follows:

(1) If the ultra high temperature heat treatment is performed at a temperature of at least 1300°C, the void defects become larger unless the initial oxide film is formed with a

thickness of 396 nm (See Figs. 11 and 14).

(2) If the initial oxygen concentration in a silicon is above 10 e10^{17} (atoms/cc), the ultra high temperature heat treatment at a temperature of at least 1300°C must be performed to eliminate the void defects (See Fig. 16).

The step of forming the initial oxide film must be performed at a temperature that does not influence the void defects, to be precise, at a temperature of 1200°C or lower. This is because with a temperature of 1200°C or more, each parameter is to be adjusted as in the invention of claim 16. Furthermore, with a temperature of 1200°C or lower, members in a quartz furnace can be also used. Therefore, patentability resides in forming the initial oxide film at a temperature of 1200°C or lower.

Applicant hereby requests reconsideration and reexamination thereof.

With the above amendments and remarks, this application is considered ready for allowance and Applicant earnestly solicits an early notice of same. Should the Examiner be of the opinion that a telephone conference would expedite prosecution of the subject application, he is respectfully requested to call the undersigned at the below-listed number.

Respectfully submitted,

WELSH & KATZ, LTD.

Gerald T. Shekleton
Registration No. 27,466

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WELSH & KATZ, LTD.
120 South Riverside Plaza
22nd Floor
Chicago, Illinois 60606-3913
Telephone: 312/655-1500